



# “The role of human capital and financial development in boosting FDI in emerging economies”

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# THE ROLE OF HUMAN CAPITAL AND FINANCIAL DEVELOPMENT IN BOOSTING FDI IN EMERGING ECONOMIES

## Abstract

This study investigates the direct and moderating effects of financial development (FD) and human capital development (HCD) on foreign direct investment (FDI) and identifies the human capital development threshold that triggers a significant impact on FDI in sixteen emerging economies from 2010 to 2023. Panel threshold and panel-corrected standard error regression methods are employed to explore these factors' direct and conditional effects on FDI. The findings indicate that, initially, FD and HCD negatively affect FDI. This can be attributed to short-term costs associated with structural adjustments and economic instability periods for the selected emerging economies. However, when these variables were interacted, their impact on FDI became positive with a total effect of 1.404, revealing the complementary effect of FD and HCD on FDI. Furthermore, a critical threshold was identified for HCD (0.7919), beyond which its impact on FDI becomes positive, facilitating long-term economic gains. Similarly, FD shifts from a negative to a positive effect as financial systems achieve greater stability and efficiency. The study emphasizes the importance of strategic investment in human capital and efforts to enhance financial sector stability to attract and sustain FDI in emerging markets. It reveals that this approach increases FDI inflows and ensures sustainable economic development over time. The study offers critical insights for policymakers to prioritize structural reforms in education, workforce skills, and financial governance to create an enabling environment for FDI. Furthermore, it highlights the relevance of understanding threshold dynamics to design targeted policies that maximize economic returns from foreign investment in emerging economies.

## Keywords

emerging economies, financial stability, FDI inflows, economic thresholds, panel data, economic development

## JEL Classification

G20, F21, J24

## INTRODUCTION

Foreign direct investment plays a critical role in driving economic growth, especially in emerging economies, by contributing to job creation, technological advancement, and enhanced productivity (Nguyen, 2022). While emerging economies account for a significant share of global foreign direct investment inflows with approximately half of the total inflows (UNCTAD, 2020), the benefits of foreign direct investment are not guaranteed and depend heavily on the domestic environment, particularly the development of financial systems and human capital (Dobrota et al., 2021; Osei & Kim, 2020). A well-functioning financial system reduces investment risks and facilitates efficient capital allocation, making it easier for foreign investors to operate (Acquah & Ibrahim, 2019; An & Yeh, 2021). Simultaneously, a skilled workforce not only increases productivity but also enables the effective absorption of the advanced technologies that accompany foreign direct investment (Sadeghi et al., 2020; Mohamed, 2022).



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Despite the acknowledged importance of financial and human capital development, emerging economies often face challenges in maximizing the potential benefits of foreign direct investment. The interaction between these two factors has not been fully explored, leaving a critical gap in understanding their combined impact. Furthermore, while individual studies have emphasized the positive influence of human capital development on foreign direct investment (An & Yeh, 2021; Pantelopoulos, 2024), little attention has been paid to identifying a minimum threshold level of human capital necessary to attract substantial foreign direct investment inflows.

## 1. LITERATURE REVIEW

The theoretical foundation of this study is rooted in endogenous growth theory, which emphasizes the role of internal factors, particularly knowledge, innovation, and human capital, in driving sustained economic growth (Chandra, 2022). Unlike traditional growth models that prioritize exogenous elements, this theory posits that investments in human capital and technological advancements generate increasing returns to scale. Once developed, knowledge and technology are shared across the economy, fostering continuous growth (Angulo-Bustanza, 2024). For example, research and development (R&D) activities not only enhance sectoral productivity but also create spillover benefits throughout the economy, contributing to overall economic performance.

The theory operates under three core assumptions: First, that investments in human capital and technology yield increasing returns (Podra et al., 2020); second, that innovation and knowledge can disseminate across industries, creating widespread economic benefits (Anand et al., 2021); and third, that sustained investment in education and skill development is essential for enhancing productivity (Doughan, 2020). This makes Endogenous Growth Theory particularly relevant for emerging economies where investments in education and infrastructure are critical to long-term development (Rangelova, 2021). However, critics argue that it may overlook external influences, such as global markets, in driving growth and may overestimate the potential for continuous growth without encountering diminishing returns (Cramer et al., 2020).

Building on the principles of this theory, the study explores the interconnected roles of Foreign Direct Investment, financial development, and human capital development in emerging markets. First, financial development creates a more efficient and

stable environment that attracts FDI by offering better access to credit, reducing transaction costs, and mitigating risks (Li et al., 2023). Second, human capital development enhances the education and skills of the workforce, attracting foreign investors seeking productive labor (Magbondé & Konté, 2022). Finally, a synergistic relationship exists between financial development and human capital, where financial systems enable investments in education, and a more skilled workforce strengthens financial markets. This synergy promotes a reinforcing cycle of growth and development, highlighting the interdependence between FDI, financial development, and human capital (Lestari et al., 2022).

Empirical studies on financial development, human capital development, and foreign direct investment (FDI) reveal significant regional disparities, particularly between developed and developing countries. In developing nations, human capital emerges as a crucial determinant of FDI; however, its impact can be moderated by factors such as institutional quality and wage levels (Abbas et al., 2021; Magbondé & Konté, 2022). Conversely, in developed countries, the availability of highly skilled labor is often assumed, shifting the focus toward innovation and advanced technological capabilities (Matthess & Kunkel, 2020). Furthermore, while financial development positively influences FDI in developing countries, excessively high levels may not necessarily lead to increased economic growth derived from FDI (Lestari et al., 2022). In contrast, developed nations typically benefit from well-established financial markets and institutions that facilitate efficient allocation and utilization of FDI (An et al., 2023; Nguyen & Lee, 2021).

Based on these findings, research indicates that both financial and human capital development significantly enhance FDI inflows, creating a

synergistic effect beneficial for host countries. Specifically, in the context of financial development and FDI, evidence means that improvements in financial systems significantly attract foreign investments, particularly in BRICS nations (Tsaurai, 2022). Regarding human capital development, empirical evidence shows that expanding human capital reduces the exit probability of foreign-owned firms, as observed in China, by fostering innovation and operational efficiency (Li et al., 2023). In Southeast Asia, the relationship between FDI and increased graduates from technical vocational education and training (TVET) highlights that foreign investments can elevate local skill levels (Ibarra-Olivo et al., 2024). The compounded positive effect of integrating financial and human capital development means that policies should harmonize both aspects to maximize investment potential (Tsaurai, 2022).

Diverse empirical studies have employed various advanced econometric techniques to explore these complex interactions. For example, Dua and Verma (2024) utilized the System Generalized Method of Moments (GMM) to assess the impact of FDI and remittances on human development across 71 developing economies, revealing a positive correlation with the Human Development Index (HDI). Similarly, Atsu and Adams (2023) employed GMM to examine the dynamic link between financial development and innovation, highlighting the role of human capital and institutions in fostering innovation. Other studies have used Ordinary Least Squares (OLS); for instance, Sharma et al. (2020) demonstrated a significant influence of human capital development on FDI in the Indian context, indicating a complementary relationship. The study by Bukhari et al. (2022) applied the Autoregressive Distributed Lag (ARDL) methodology to investigate the long- and short-term impacts of FDI on financial sector development in Pakistan. Moreover, Amadi (Ugonna & John, 2022) used cointegration and OLS techniques in Nigeria, emphasizing the significance of stock market development. Recent studies in the Economic Community of West African States (ECOWAS), such as Pokou (2020), employed Granger causality tests to establish significant links between FDI inflows and financial development, emphasizing the need for policymakers to understand these dynamics. Instrumental

Variable Techniques were utilized by Ramzan et al. (2019) to explore the varying effects of FDI on economic growth contingent on human capital levels, revealing a threshold effect.

While the positive relationship between financial and human capital development and FDI is well-documented, some argue that the benefits may not be uniformly distributed, potentially leading to regional disparities in economic growth. Therefore, this study employs panel-corrected standard error techniques to address country heterogeneity among emerging economies. Notably, while financial development and human capital are essential for attracting FDI in both developed and developing countries, the specific impacts and necessary policy interventions can vary significantly based on the level of development. Thus, this study differs from previous research by determining the threshold level of human capital development that triggers significant FDI in emerging economies.

In line with the literature, this study addresses the gaps in the literature by examining the direct and moderating effects of financial development and human capital development on foreign direct investment, as well as identifying the threshold of human capital development that triggers a significant impact on FDI.

## 2. METHOD

This study examines the combined effects of financial development and human capital development on foreign direct investment (FDI) in emerging markets. It focuses on 16 emerging economies: Argentina, Brazil, China, Colombia, the Czech Republic, Indonesia, India, Mexico, Malaysia, Peru, the Philippines, the Republic of Korea, Thailand, Turkey, Singapore, and South Africa. These countries were chosen based on their classification as emerging markets by the IMF in 2020 and their notable FDI inflows during the study period. The selection of these nations ensures a diverse representation of emerging markets, reflecting varying levels of economic, financial, and human capital development. The data cover the period from 2010 to 2023, providing a comprehensive overview of economic cycles, including phases of global financial stability and instability with shocks such as the COVID-19 pandemic. The COVID-19 pan-

demic and the subsequent global disruptions have significantly altered FDI patterns; therefore, utilizing data covering these periods is very necessary in addressing a fundamentally different context shaped by unique challenges such as lockdowns, supply chain disruptions, and extraordinary fiscal measures.

The interplay between financial development, human capital development, and FDI remains highly relevant for policymakers in emerging economies. Even in the wake of the pandemic, factors such as financial system maturity and workforce quality continue to play an important role in driving FDI inflows and supporting long-term economic growth. This study offers critical insights for guiding strategic reforms and investments that attract and sustain FDI, which is essential for post-crisis recovery. Additionally, the findings establish a robust pre-pandemic benchmark, enabling future research to explore how global events may have influenced these relationships. Data on financial development were obtained from the International Monetary Fund (IMF) Financial Sector Development Index, while human capital development data were derived from the United Nations Development Programme (UNDP) index. FDI, measured as a percentage of GDP, serves as the dependent variable. Table 1 provides a description and measurement for each of the variables employed in this study.

The econometric approach adopted for the analysis includes Hansen's (2000) panel threshold regres-

sion and Panel Corrected Standard Errors (PCSE) techniques. Hansen's panel threshold model is employed to capture potential non-linear relationships and identify threshold effects between human capital development and FDI, while PCSE helps to address issues of autocorrelation, heteroscedasticity, and cross-sectional dependence.

The core empirical model posits that financial development and human capital development influence FDI inflows in emerging markets. The baseline models for financial development and human capital development are specified as follows:

$$FDI_{it} = \alpha_0 + \alpha_1 Findev_{it} + Z_{it} + \mu_{it}, \quad (1)$$

$$FDI_{it} = \beta_0 + \beta_1 HCD_{it} + Z_{it} + \mu_{it}, \quad (2)$$

where  $FDI_{it}$  represents foreign direct investment as a percentage of GDP in country  $i$  at time  $t$ . Financial development ( $Findev_{it}$ ) and human capital development ( $HCD_{it}$ ) are the key explanatory variables. Additionally,  $Z_{it}$  is a vector of control variables, including trade openness, tax revenue, population growth, and urbanization—factors that are expected to influence FDI based on existing literature (e.g., Sitepu & Tampubolon, 2024; Camara, 2023; Rong et al., 2020; Hou et al., 2021; Grekou and Owoundi, 2020; Voumik et al., 2023).

To assess the complementary impact of financial development and human capital development on FDI, the following interaction model is proposed:

**Table 1.** Description and measurement of variables

Variable	Description	Measurement
<b>Dependent</b>		
Foreign Direct Investment (FDI)	Investment made by a company or individual in one country in business interests in another country	Net inflows as a percentage of GDP
<b>Independent</b>		
Human Capital Development.	The process of improving the knowledge, skills, and health of a population to enhance economic productivity	An index covering life expectancy, mean years of schooling, GNI, and literacy rate
Financial Development	The expansion and improvement of financial markets and institutions to facilitate economic activities	Domestic credit to the private sector as a percentage of GDP
<b>Controls</b>		
Trade Openness	The extent to which a country engages in international trade.	Sum of exports and imports as a percentage of GDP.
Tax Revenue	Government income generated from taxes	As a percentage of GDP
Population Growth	The rate at which the population of a country increases over time	Annual percentage growth rate based on the total population
Urbanization	The proportion of a population living in urban areas	The annual urbanization growth rate

$$FDI_{it} = \gamma_0 + \gamma_1 Findev_{it} + \gamma_2 HCD_{it} + \gamma_3 (Findev \cdot HCD)_{it} + Z_{it} + \mu_{it}. \quad (3)$$

The interaction term  $(Findev \cdot HCD)_{it}$  allows the study to capture the combined effects of financial development and human capital development on FDI. To quantify the total effect of each factor, the model's partial derivatives with respect to financial development and human capital development are computed, following Baltagi et al (2009). These are presented as:

$$\frac{\delta FDI_{it}}{\delta Findev_{it}} = \gamma_1 + \gamma_3 HCD_{it}, \quad (4)$$

$$\frac{\delta FDI_{it}}{\delta HCD_{it}} = \gamma_2 + \gamma_3 Findev_{it}. \quad (5)$$

The PCSE method is adopted for estimating the models, as it corrects for heteroscedasticity, autocorrelation, and cross-sectional dependence, which are common in panel datasets. This approach is chosen over Feasible Generalized Least Squares (FGLS) due to the structure of the data (with more cross-sectional units than time periods), as FGLS may underestimate standard errors in smaller samples (Breitung & Salish, 2021). The two-step PCSE procedure involves transforming the data to eliminate serial correlation, followed by applying Ordinary Least Squares (OLS) with corrected standard errors.

Before estimating the models, the presence of cross-sectional dependence is tested using Pesaran's (2021) cross-sectional dependency test. Cross-sectional dependence could bias the estimates, making it necessary to verify and correct this issue in the panel data structure.

Finally, the threshold regression technique proposed by Hansen (2000) is employed to detect non-linearities in the relationship between human capital development and FDI. This method endogenously identifies the threshold at which the effect of human capital development on FDI shifts from negative to positive. The model can be expressed as:

$$FDI_{it} = \begin{cases} \beta_0^1 + \beta_1^1 HCD_{it} + \beta_2^1 X_{it} + \varepsilon_i, & HCD_{it} \leq \gamma \\ \beta_0^2 + \beta_1^2 HCD_{it} + \beta_2^2 X_{it} + \varepsilon_i, & HCD_{it} > \gamma \end{cases}. \quad (6)$$

In this model,  $HCD_{it}$  serves as the threshold variable, with  $\gamma$  being the unknown threshold parameter. The model tests for nonlinearity and identifies whether human capital development has a differential effect on FDI below and above the threshold.

Through this combined methodological framework, the study effectively addresses both linear and non-linear dynamics in the relationship between financial development, human capital, and FDI, providing a deeper understanding of their interplay in emerging markets.

### 3. RESULTS

The descriptive statistics for emerging economies provide several critical insights into the dynamics of foreign direct investment and related variables (Table 2). The average foreign direct investment stands at 3.803, with a substantial standard deviation of 5.695, indicating significant variability across countries. This variability implies that while some emerging economies are highly attractive to foreign investors, others struggle to attract substantial investment, which can have implications for their economic growth and development.

In terms of Human capital development, the mean value is 0.797, accompanied by a low standard deviation of 0.064. This consistency implies that emerging economies generally maintain a stable investment level in education and skills, potentially enhancing their ability to attract foreign direct investment through a skilled workforce. Conversely, Financial development shows a mean of 70.204 and a high standard deviation of 43.736, reflecting diverse levels of financial infrastructure among these economies. This variation in financial development can influence the effectiveness of capital allocation and investment opportunities available to foreign investors.

Trade openness averages 84.805, with a large standard deviation of 75.389, indicating that the degree of integration into the global market varies significantly among these economies. This dis-

**Table 2.** Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Foreign Direct Investment	224	3.803	5.695	0.858	34.949
Human Capital Development	224	0.7977	0.064	0.61	0.89
Financial Development	224	70.204	43.736	10.662	194.674
Trade Openness	224	84.805	75.389	22.486	379.099
Tax Revenue	224	13.045	4.945	0.247	26.005
Population Growth	224	0.012	1.007	-6.713	7.403
Urbanization	224	70.377	17.535	30.93	100

parity may affect how emerging markets compete for foreign direct investment. Tax revenue, with a mean of 13.045 and a standard deviation of 4.945, indicates moderate consistency in fiscal capacity, which may influence governments' ability to invest in infrastructure and services that can attract foreign direct investment. Population growth averages 0.012, showing a slow growth with moderate variability, while Urbanization, with a mean of 70.377, reflects a clear trend toward urban living. This urbanization trend can be important in shaping the investment environment, as urban areas typically offer better infrastructure and access to services, making them more attractive to foreign investors.

The correlation matrix in Table 3 highlights several significant relationships among the variables, providing insights into the dynamics influencing foreign direct investment in emerging economies. Notably, foreign direct investment exhibits a strong positive correlation with trade openness (0.828), indicating that countries with more open economies are likely to attract higher levels of FDI. This finding reveals the importance of trade

policies in shaping investment environments, as greater openness can facilitate market access and reduce barriers for foreign investors.

Additionally, human capital development shows a moderate positive correlation with foreign direct investment (0.169). This implies that nations investing in their workforce through education and skill enhancement become more appealing to foreign investors, reflecting the critical role of a skilled labor force in attracting investment. The positive correlation between Urbanization and HCD (0.234) further indicates that urban areas may provide better educational and skill development opportunities, creating a conducive environment for FDI.

In contrast, Financial Development displays weak to moderate correlations with most variables, with the positive relationship being with Trade Openness (0.352). This implies that while financial systems are essential, their direct movement with FDI may be less pronounced compared to trade policies and human capital. Moreover, Tax revenue shows minimal correlation with most vari-

**Table 3.** Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>(1) Foreign Direct Investment</b>	<b>1.000</b>						
(2) Human Capital Development	0.169* (0.011)	1.000					
(3) Financial Development	0.146* (0.029)	-0.153* (0.022)	1.000				
(4) Trade Openness	0.828* (0.000)	0.009 (0.895)	0.352* (0.000)	1.000			
(5) Tax Revenue	-0.049 (0.466)	0.182* (0.006)	-0.025 (0.710)	0.028 (0.682)	1.000		
(6) Population Growth	-0.056 (0.406)	0.094 (0.160)	-0.094 (0.161)	-0.112 (0.095)	0.057 (0.395)	1.000	
(7) Urbanization	0.460* (0.000)	0.234* (0.000)	-0.005 (0.937)	0.352* (0.000)	0.088 (0.189)	0.032 (0.633)	1.000

Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 4.** Panel corrected standard error diagnostic tests

Source: STATA Output, 2024.

Test	Null	Statistics	Probability	Decision
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	<i>Ho: Constant variance</i>	162.04	0.0531	Reject
Ramsey RESET	<i>Ho: The model has no omitted variables</i>	24.53	0.2199	Accept
Normality	<i>Ho: Not normally distributed residual</i>	40.380	0.3922	Reject
Wooldridge test for autocorrelation	<i>Ho: No first-order autocorrelation</i>	6.9774	0.3008	Accept
Endogeneity (orthogonality conditions)	<i>Ho: Variables are exogenous</i>	0.6257	0.4289	Accept
Variance inflation factor	<i>Ho: The presence of multicollinearity</i>	VIF	1.16	Reject
Cross-Sectional Dependency	<i>Ho: No cross-sectional dependency</i>	0.511	0.0037	Reject

ables, with only a weak positive relationship with FD (0.182). This finding implies that fiscal capacity may not significantly influence FDI decisions, which could be an area for further investigation.

Before analyzing the complementary effect of Human capital development and financial development on foreign direct investment, the study conducted some diagnostic tests. The diagnostic tests are essential to ensure the robustness and reliability of the econometric model by identifying issues such as heteroskedasticity, autocorrelation, and multicollinearity, which can bias the results.

The diagnostic statistics presented in Table 4 offer critical insights into the statistical properties of the panel-corrected standard error tests employed in this study. The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity indicates a significant presence of non-constant variance with a statistic of 162.04 and a p-value of 0.0531, implying that robust standard errors should be used to ensure efficient estimates. Conversely, the Ramsey RESET test supports model specification with a statistic of 24.53 and a p-value of 0.2199, indicating that no important variables are omitted. Furthermore, the normality test implies that residuals are normally distributed with statistics of 40.380 and a p-value of 0.3922, supporting the validity of hypothesis testing. The Wooldridge test for autocorrelation reveals no first-order autocorrelation with a statistic of 6.9774 and a p-value of 0.3008, confirming the independence of error terms. Additionally, the endogeneity test indicates exogenous variables with a statistic of 0.6257 and a p-value of 0.4289, enhancing the robustness of the results. The variance inflation factor (VIF) of 1.16 shows no significant multicollinearity, while the cross-sectional dependency test highlights correlated observa-

tions across countries with a statistic of 0.511 and a p-value of 0.0037. These diagnostic results validate the model's assumptions and underscore the need for addressing issues like heteroskedasticity and cross-sectional dependency in future research to strengthen conclusions about financial development, human capital development, and foreign direct investment in emerging economies.

Based on the diagnostic tests, utilizing Panel Corrected Standard Errors (PCSE) is appropriate to address heteroskedasticity and cross-sectional dependency, enhancing model accuracy. Therefore, Table 5 presents the PCSE results for the main effect and the moderating effect of human capital development and financial development on FDI.

The results in Table 5 provide critical insights into the effects of human capital development and financial development on foreign direct investment in emerging markets. Specifically, in model 1, HCD demonstrates a statistically significant negative main effect of  $-0.130$  in the baseline model, indicating that increased human capital investment may initially deter foreign investors due to short-term costs. Similarly, in model 2, FD exhibits a negative main effect of  $-0.0186$ , also significant, suggesting that rapid financial development may introduce instability by increasing uncertainty and risk, making emerging markets less attractive to investors, which affects FDI negatively.

In the moderating model, model 3, HCD maintains a significant negative effect of  $-0.0609$ , while FD displays a significant negative effect of  $-0.153$ . Notably, although individual effects of HCD and FD are negative, their interaction term ( $HCD \cdot FD$ ) reveals a significant positive effect of 0.0218, with a total combined effect of 1.4004.

**Table 5.** Impact of the complementarity between human capital and financial development on foreign direct investment in emerging markets

Variables	(1)	(2)	(3)
	FDI	FDI	FDI
Human Capital Development	-0.130*** (0.0230)		-0.0609** (0.0551)
Financial Development		-0.0186*** (0.00207)	-0.153** (0.0667)
Human Capital * Financial Development			0.0218** (0.000877)
Trade Openness	0.0585*** (0.00442)	0.0620*** (0.00462)	0.0602*** (0.00452)
Tax Revenue	-0.128*** (0.0358)	-0.106*** (0.0317)	-0.130*** (0.0372)
Population Growth	0.104 (0.109)	0.125 (0.128)	0.0936 (0.136)
Urbanization	0.0528*** (0.00454)	0.0575*** (0.00399)	0.0589*** (0.00690)
Total Effect [ $\beta_1 + \beta_3 \cdot FD$ ]			1.4004*** (0.0657)
Constant	-13.31*** (1.708)	-2.814*** (0.542)	-2.248 (3.942)
Observations	224	224	224
R-squared	0.745	0.744	0.762
Number of countries	16	16	16
<b>Marginal Effect</b>			
<b>Model VCE: Panel-corrected Standard Errors</b>			
Human Capital Development		dy/dx	0.961** (0.0495)
Financial Development		dy/dx	0.153** (0.067)

Note: Dependent Variable – Foreign Direct Investment; Standard errors in parentheses; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; Sensitivity analysis is based on the Delta method.

This implies a synergistic relationship between HCD and FD that enhances FDI potential. The marginal effects analysis shows that HCD contributes positively to FDI with an effect of 0.961, whereas FD has a substantial positive marginal effect of 0.153, reinforcing its critical role in attracting investment.

Additionally, control variables reveal that trade openness positively impacts FDI, with effects of 0.0585, 0.0620, and 0.0602 across the models, respectively. Conversely, tax revenue exhibits negative effects of -0.128, -0.106, and -0.130, indicating that higher taxes may deter FDI. Finally, urbanization consistently contributes positively with an effect of 0.0528, 0.0575, and 0.0589, respectively, across models.

To analyze the minimum threshold level of human capital development to enable significant Foreign

Direct Investment in emerging markets, the study conducted a threshold diagnostic test to identify non-linear relationships and critical points in data, ensuring that subsequent analyses, such as the Hansen threshold estimate, accurately capture the dynamics of variables in emerging markets.

**Table 6.** Threshold diagnostic test

Diagnostic test	Outcome
Number of Bootstrap Replications	2000
Trimming Percentage	15
Threshold Estimate	0.7919
LM-test for no threshold	52.7791
Bootstrap P-Value	0

Note: Test of null hypothesis of no threshold against alternative of threshold allowing heteroskedastic errors (white corrected).

The Threshold Diagnostic Test results provide crucial insights into the non-linear dynam-

ics of economic variables in emerging markets. The test was conducted with 2,000 bootstrap replications and a 15% trimming percentage, which reveals a significant threshold effect. The threshold estimate of 0.7919 indicates a critical point at which the relationship between human capital development fundamentally changes its impact on FDI in emerging markets. Moreover, the LM-test for no threshold yields a statistic of 52.7791, with a bootstrap p-value of 0. This result strongly rejects the null hypothesis of no threshold, providing robust evidence for the presence of a threshold effect. The use of White-corrected errors ensures the reliability of these results even in the presence of heteroscedasticity, a common issue in economic data. The threshold results are presented in Table 7.

The Hansen threshold results in Table 7 illustrate the non-linear relationship between human capital development and foreign direct investment in emerging markets. Specifically, the analysis identifies a critical threshold of 0.7919 in HCD, above which FDI dynamics shift markedly. In the lower regime ( $q \leq 0.7919$ ), HCD exerts a negative effect of  $-0.3381$  on FDI, suggesting that initial investments in human capital may deter foreign investors due to associated

costs. However, once the threshold is surpassed ( $q > 0.7919$ ), the effect becomes strongly positive at 0.9897, indicating that sufficient human capital development can significantly enhance FDI attractiveness.

Financial development exhibits a comparable pattern, showing a negative effect of  $-0.0156$  in the lower regime, which transitions to a positive effect of 0.1198 in the upper regime. This implies that while initial financial development may introduce risks, advancing beyond a certain level can positively influence FDI.

Among the control variables, trade openness positively affects FDI in both regimes, with a more pronounced impact in the lower regime, thus 0.0167 and 0.0637, respectively. Tax revenue transitions from a negative effect of  $-0.3826$  in the lower regime and maintains the negative effect of  $-0.1119$  in the upper regime, indicating that higher levels of human capital may not allow countries to leverage tax revenues more effectively to attract FDI. Lastly, urbanization exhibits a positive effect in both regimes, with a notably stronger impact of 0.8225 in the upper regime, highlighting the significance of urban infrastructure in enhancing FDI attraction.

**Table 7.** Hansen splitting threshold results for human capital development level to enable significant FDI in emerging markets

Variables	(3) Without Threshold	(4) Lower Regime $q \leq 0.7919$	(5) Upper Regime $q > 0.7919$
Human Capital Development	$-0.1151^{***}$ (0.03126)	$-0.3381^{***}$ (0.0559)	$0.9897^{***}$ (0.0447)
Financial Development	$-0.01641^{***}$ (0.0043)	$-0.0156^{***}$ (0.0031)	$0.1198^{***}$ (0.0071)
Trade Openness	$0.0622^{***}$ (0.0052)	$0.0167^{***}$ (0.0044)	$0.0637^{***}$ (0.0053)
Tax Revenue	$-0.1286^{***}$ (0.0534)	$-0.3826^{***}$ (0.0245)	$-0.1119^{**}$ (0.0608)
Population Growth	$0.0793$ (0.1535)	$0.1829$ (0.1131)	$0.1723$ (0.1924)
Urbanization	$0.0482^{***}$ (0.0096)	$0.1775^{***}$ (0.0169)	$0.8225^{***}$ (0.1924)
Intercept	$-11.0182^{***}$ (2.3612)	$2.8355^{***}$ (0.5599)	$-7.0539^{***}$ (0.2295)
R-squared	$0.8377$	$0.3452$	$0.8426$
Threshold Value		$0.7919$	
Threshold C.I		[0.6208 – 0.8447]	

Note: Dependent Variable – Foreign Direct Investment; Heteroskedasticity Correction Used; Standard errors in parentheses; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## 4. DISCUSSION

The results in Table 5 reveal critical insights regarding the main effects of human capital development and financial development on foreign direct investment (FDI) in emerging markets. Notably, human capital development exhibits a negative effect on FDI, suggesting that increased investment in education and skills may lead to short-term economic costs, such as higher education expenses and opportunity costs. However, empirical studies emphasize that these initial costs are outweighed by long-term benefits, including enhanced productivity and innovation (Abbas et al., 2021). This finding indicates that while investing in human capital is essential, it may not yield immediate returns in terms of FDI attraction.

Similarly, financial development also shows a negative effect on FDI. This means that rapid financial growth can create economic instability in emerging markets, corroborating Lestari et al. (2022), who caution against financial liberalization without adequate regulatory frameworks. This is critical, as emerging economies must balance financial expansion with robust regulatory measures to attract foreign investors effectively.

In the moderating model, human capital development remains negatively correlated with FDI, indicating that the benefits of such investments may be constrained by existing economic structures. Li et al. (2023) emphasize the importance of complementary institutional frameworks in maximizing the potential of human capital. Conversely, financial development demonstrates a positive moderating effect, suggesting that financial advancements can improve economic outcomes when aligned with supportive policies. This is supported by Mbuthia and Ndiritu (2020), who highlight the significant role of financial systems in economic growth.

The positive interaction between financial development and human capital means that their complementarity can yield substantial economic benefits. This finding aligns with Atsu and Adams (2023), who argue that innovation-driven growth is fueled by the interplay between education and finance. Thus, strategically integrating human capital and financial development initiatives is crucial for emerging markets to achieve robust economic growth.

Regarding the marginal effects of human capital development, findings indicate that incremental improvements in education and skills can attract more foreign capital. This aligns with Mohamed (2022), who underscores the role of human capital in influencing international capital flows. Similarly, advancements in financial development significantly enhance a country's attractiveness to foreign investors, supporting Nguyen and Lee (2021), who stress the importance of well-developed financial markets in maximizing FDI benefits. Collectively, these results illustrate the critical roles that both human capital and financial development play in fostering FDI inflows in emerging economies.

Turning to control variables, trade openness consistently shows a positive effect on FDI across both models, supporting the findings of Voumik et al. (2023), who emphasize the importance of trade in economic growth. Conversely, the negative impact of tax revenue in both models means that higher taxes may deter FDI, consistent with Camara's (2023) findings on the adverse effects of taxation on investment. In contrast, urbanization shows a positive impact, highlighting the role of urban infrastructure in attracting FDI. This finding aligns with Grekou and Owoundi (2020), who discuss the economic benefits of urbanization.

In Table 7, the Hansen threshold results indicate a critical threshold of 0.7919 in human capital development, above which the dynamics of FDI attraction change significantly. This aligns with the development threshold concept proposed by Hou et al. (2021), suggesting that economies may experience sudden shifts in growth patterns upon reaching certain critical levels of human capital. The negative effect of human capital development in the lower regime implies that initial investments in human capital may not translate into increased FDI. This is consistent with Hou et al. (2021), who argue that a minimum threshold of human capital is essential for FDI to positively impact economic growth. Conversely, in the upper regime, where the effect becomes strongly positive, it indicates that once a critical mass of human capital is attained, it significantly enhances FDI attraction. This supports the endogenous growth theory, which emphasizes the crucial role of human capital in driving economic development (Chandra, 2022; Podra et al., 2020).

Financial development exhibits a similar pattern, transitioning from a negative effect in the lower regime to a positive effect in the upper regime. This transition underscores the complementarity between human capital and financial development in attracting FDI, as highlighted by Islam et al. (2021) in their study on FDI spillovers and financial markets.

For the control variables, trade openness continues to show a positive effect in both regimes, although it is stronger in the lower regime, reinforcing

Tsaurai's (2021) assertions regarding trade policy's role in FDI-led growth. Tax revenue transitions from a negative to a strong positive effect in the upper regime, indicating that higher levels of human capital may enable countries to leverage tax revenues more effectively for FDI attraction, aligning with fiscal policy effectiveness theories discussed by Sharma et al. (2020). Lastly, the stable positive effect of urbanization in both regimes, especially in the upper regime, supports Rong et al. (2020), who detail the economic advantages of urbanization.

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## CONCLUSION

This study examined the direct and moderating effects of financial development and human capital development on foreign direct investment. It also identified the threshold of human capital development that triggers a significant impact on FDI. The findings reveal that while both HCD and FD exhibit significant but initially negative effects on FDI, their interaction creates a positive complementary effect, indicating substantial long-term economic potential. The threshold analysis further highlights that below a specific level of HCD, FDI is negatively impacted; however, surpassing this threshold results in robust growth in FDI, with a similar pattern observed for FD. In light of these conclusions, policymakers in emerging markets should prioritize investments in human capital development, recognizing its critical role in driving long-term FDI growth. While initial investments in education and workforce development may not yield immediate results, reaching the identified threshold is essential to unlock the full potential of human capital in attracting FDI.

Equally important is strengthening the stability of the financial sector. The initial risks associated with financial development can lead to economic instability, negatively impacting emerging markets. Policymakers must implement reforms that enhance regulatory frameworks, improve financial governance, and bolster resilience within the financial sector and to mitigate short-term risks. Moreover, the synergistic relationship between HCD and FD presents significant economic opportunities when pursued collaboratively. Rather than addressing these domains in isolation, policymakers should promote coordinated strategies that maximize their combined impact on FDI attraction and economic growth.

Finally, while short-term costs may arise from investments in human capital and financial development, it is crucial for policymakers to effectively communicate the long-term benefits to the public. Building public confidence in these initiatives will ensure sustained support for policies that promise significant economic returns over time. This study is limited by the number of controlled variables and focuses on emerging economies only. Therefore, future studies are recommended to consider other relevant controlled variables contingent on their availability. Also, other studies can be conducted on a regional basis to guide policymakers on regional comparisons.

## AUTHOR CONTRIBUTIONS

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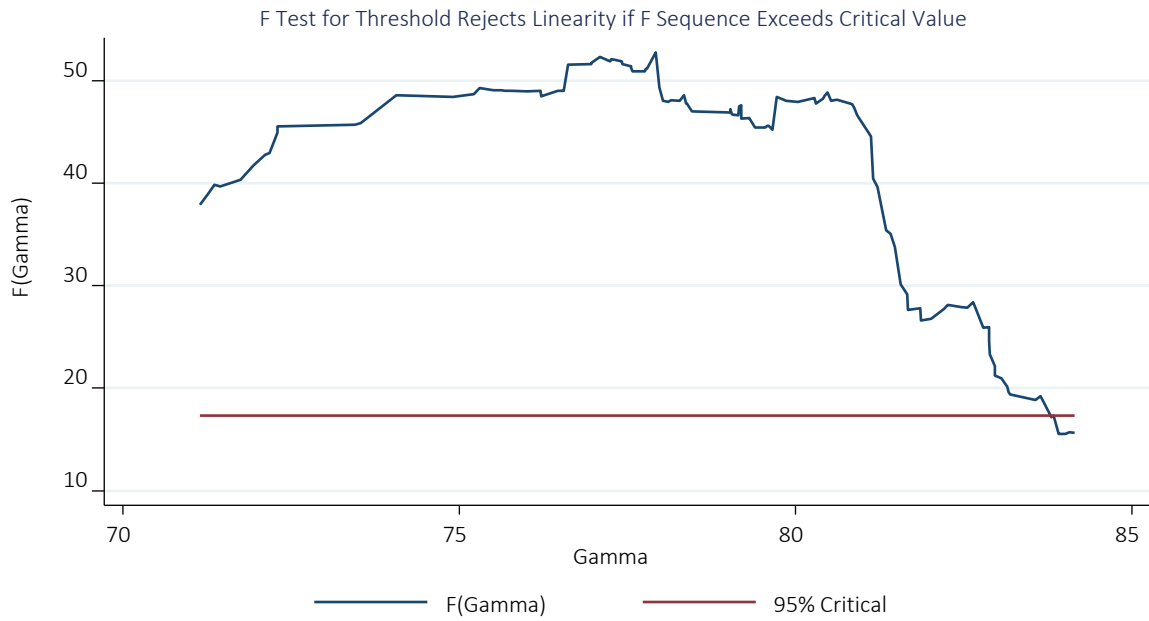
## REFERENCES

1. Abbas, A., Moosa, I., & Ramiah, V. (2021). The contribution of human capital to foreign direct investment inflows in developing countries. *Journal of Intellectual Capital*, 23(1), 9-26. <https://doi.org/10.1108/jic-12-2020-0388>
2. Acquah, A. M., & Ibrahim, M. (2019). Foreign direct investment, economic growth and financial sector development in Africa. *Journal of Sustainable Finance & Investment*, 10(4), 315-334. <https://doi.org/10.1080/20430795.2019.1683504>
3. An, T. H. T., Chen, S. H., & Yeh, K. C. (2023). Does financial development enhance the growth effect of FDI? A multidimensional analysis in emerging and developing Asia. *International Journal of Emerging Markets*. <https://doi.org/10.1108/ijjem-03-2022-0495>
4. An, T. T., & Yeh, K. (2021). Growth effect of foreign direct investment and financial development: New insights from a threshold approach. *Journal of Economics and Development*, 23(2), 144-162. <https://doi.org/10.1108/jed-08-2020-0108>
5. Anand, J., McDermott, G., Mudambi, R., & Narula, R. (2021). Innovation in and from emerging economies: New insights and lessons for international business research. *Journal of International Business Studies*, 52(4), 545-559. <https://doi.org/10.1057/s41267-021-00426-1>
6. Angulo-Bustinza, H. D. (2024). Economic Growth Theory. In *International Trade and Inclusive Economic Growth: A Case Study of Peru and China* (pp. 3-18). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-83753-470-82024002>
7. Atsu, F., & Adams, S. (2023). Financial development and innovation: Do institutions and human capital matter? *Heliyon*, 9(8), e19015. <https://doi.org/10.1016/j.heliyon.2023.e19015>
8. Baltagi, B. Demetriades, P. and Law, S.H. (2009). Financial development and openness: Evidence from panel data. *Journal of Development Economics*, 89(2), 285-296. <https://doi.org/10.2139/ssrn.1808903>
9. Breitung, J., & Salih, N. (2021). Estimation of heterogeneous panels with systematic slope variations. *Journal of Econometrics*, 220(2), 399-415. <https://doi.org/10.1016/j.jeconom.2020.04.007>
10. Bukhari, S. J., Cheema, A. R., & Shah, S. Z. (2022). Literacy, poverty and trade openness in Pakistan: An empirical investigation. *Journal of Accounting and Finance in Emerging Economies*, 8(1), 13-24. <https://doi.org/10.26710/jafee.v8i1.2112>
11. Camara, A. (2023). The effect of foreign direct investment on tax revenue. *Comparative Economic Studies*, 65(1), 168-190. <https://doi.org/10.1057/s41294-022-00195-2>
12. Chandra, R. (2022). *Endogenous growth in historical perspective: From Adam Smith to Paul Romer*. London: Palgrave Macmillan.
13. Cramer, C., Sender, J., & Oqubay, A. (2020). *African economic development: Evidence, theory, policy* (p. 336). Oxford University Press.
14. Dobrota, M., Zornić, N., & Marković, A. (2021). FDI time series forecasts: evidence from emerging markets. *Management: Journal of Sustainable Business and Management Solutions in Emerging Economies*, 26(2), 77-88. <https://doi.org/10.7595/management.fon.2021.0010>
15. Doughan, Y. A. R. (2020). Factors of production, economic growth, and sustainable development. In *Decent Work and Economic Growth* (pp. 427-439). Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-319-95867-5\\_121](https://doi.org/10.1007/978-3-319-95867-5_121)
16. Dua, P., & Verma, N. (2024). FDI–Growth Nexus in Emerging Economies: Role of Financial Sector Development. *Foreign Trade Review*. <https://doi.org/10.1177/00157325241227326>
17. Grekou, C., & Owoundi, F. (2020). Understanding how foreign direct investment inflows impact urbanization in Africa. *International Economics*, 164, 48-68. <https://doi.org/10.1016/j.inteco.2020.07.002>
18. Hansen, B. E. (2000). Sample splitting and threshold estimation. *Econometrica*, 68(3), 575-603. <https://doi.org/10.1111/1468-0262.00124>
19. Hou, L., Li, Q., Wang, Y., & Yang, X. (2021). Wages, labour quality, and FDI inflows: A new non-linear approach. *Economic Modelling*, 102, 105557. <https://doi.org/10.1016/j.econmod.2021.105557>
20. Ibarra-Olivo, J. E., Neise, T., Breul, M., & Wrana, J. (2024). FDI and human capital development: A tale of two Southeast Asian economies. *Journal of International Business Policy*, 7(3), 314-336. <https://doi.org/10.1057/s42214-024-00186-3>
21. Islam, M. A., Liu, H., Khan, M. A., Islam, M. T., & Sultanuzzaman, M. R. (2021). Does foreign direct investment deepen the financial system in Southeast Asian economies? *Journal of Multinational Financial Management*, 61, 100682. <https://doi.org/10.1016/j.mulfin.2021.100682>
22. Lestari, D., Lesmana, D., Azizil Yudaruddin, Y., & Yudaruddin, R. (2022). The impact of financial

- development and corruption on foreign direct investment in developing countries. *Investment Management and Financial Innovations*, 19(2), 211-220. [https://doi.org/10.21511/imfi.19\(2\).2022.18](https://doi.org/10.21511/imfi.19(2).2022.18)
23. Li, C., Li, L., Tang, H., Zheng, Y., & Gong, F. (2023). Human capital development and its influence on FDI withdrawal: An empirical analysis. *China & World Economy*, 31(5), 116-134. <https://doi.org/10.1111/cwe.12504>
  24. Magbondé, G. K., & Konté, M. A. (2022). Developing countries' economic fundamentals and FDI inflows: The moderating role of institutions. *Cogent Economics & Finance*, 10(1). <https://doi.org/10.1080/23322039.2022.2028976>
  25. Matthes, M., & Kunkel, S. (2020). Structural change and digitalization in developing countries: Conceptually linking the two transformations. *Technology in Society*, 63, 101428. <https://doi.org/10.1016/j.techsoc.2020.101428>
  26. Mbutia, A. N., & Ndiritu, A. W. (2020). Mobilization of domestic savings in formal financial institutions: the missing link to economic growth. *International Journal of Business and Social Science*, 11(3), 69-78. <https://doi.org/10.30845/ijbss.v11n3a9>
  27. Mohamed S. I. (2022). Foreign capital inflows and economic growth in North African countries: The role of human capital. *Journal of the Knowledge Economy*, 13(4), 2804-2821. <https://doi.org/10.1007/s13132-021-00843-5>
  28. Nguyen, C. P., & Lee, G. S. (2021). Uncertainty, financial development, and FDI inflows: Global evidence. *Economic Modelling*, 99, 105473. <https://doi.org/10.1016/j.econmod.2021.02.014>
  29. Nguyen, M. L. T. (2022). Foreign direct investment and economic growth: The role of financial development. *Cogent Business & Management*, 9(1). <https://doi.org/10.1080/23311975.2022.2127193>
  30. Osei, M. J., & Kim, J. (2020). Foreign direct investment and economic growth: Is more financial development better? *Economic Modelling*, 93, 154-161. <https://doi.org/10.1016/j.econmod.2020.07.009>
  31. Pantelopoulos, G. (2024). Human capital, gender equality and foreign direct investment: Evidence from OECD countries. *Journal of the Knowledge Economy*, 15(2), 5608-5624. <https://doi.org/10.1007/s13132-023-01343-4>
  32. Pesaran, M. H. (2021). General diagnostic tests for cross-sectional dependence in panels. *Empirical Economics*, 60(1), 13-50. <https://doi.org/10.1007/s00181-020-01875-7>
  33. Podra, O., Kurii, L., Alkema, V., Levkiv, H., & Dorosh, O. (2020). Theoretical aspects of human capital formation through human potential migration redistribution and investment process. *Business: Theory and Practice*, 21(1), 71-82. <https://doi.org/10.3846/btp.2020.11197>
  34. Pokou, K. (2020). FDI inflows and financial development in Ecowas: Causality analysis in the frequency domain. *Asian Economic and Financial Review*, 10(8), 946-955. <https://doi.org/10.18488/journal.aefr.2020.108.946.955>
  35. Ramzan, M., Sheng, B., Fatima, S., & Jiao, Z. (2019). Impact of FDI on economic growth in developing countries: Role of human capital. *Seoul Journal of Economics*, 32(3). Retrieved from [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3445339](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3445339)
  36. Rangelova, R. (2021). Economic growth and development of the concept of convergence – theoretical basis. *Economic Studies*, 5, 3-26. Retrieved from <https://ideas.repec.org/a/bas/econst/y2021i5p3-26.html>
  37. Rong, S., Liu, K., Huang, S., & Zhang, Q. (2020). FDI, labour market flexibility and employment in China. *China Economic Review*, 61, 101449. <https://doi.org/10.1016/j.chieco.2020.101449>
  38. Sadeghi, P., Shahrestani, H., Kiani, K. H., & Torabi, T. (2020). Economic complexity, human capital, and FDI attraction: A cross country analysis. *International Economics*, 164, 168-182. <https://doi.org/10.1016/j.inteco.2020.08.005>
  39. Sharma, S., Kaur, M., Sharma, P., & Sandhu, S. (2020). A study of the relationship and impact of foreign direct investment on the economic growth rate of India. *International Journal of Economics and Financial Issues*, 10(5), 327-330. <https://doi.org/10.32479/ijefi.10463>
  40. Sitepu, K., & Tampubolon, A. M. (2024). Government Policies and Foreign Direct Investment: Driving Sustainable Economic Growth and Development. *Inspirasi & Strategi (INSPIRAT): Jurnal Kebijakan Publik & Bisnis*, 15(1), 1-9. <https://ejournal.isha.or.id/index.php/Inspirat/article/view/335>
  41. Tsurai, K. (2021). Determinants of trade openness in transitional economies: Does the complementarity between foreign direct investment and human capital development matter? *International Journal of Economics & Business Administration (IJEBA)*, 9(1), 318-330. <https://doi.org/10.35808/ijeaba/675>
  42. Tsurai, K. (2022). Role of financial sector development in foreign direct investment inflows in BRICS. *Investment Management and Financial Innovations*, 19(3), 215-228. [https://doi.org/10.21511/imfi.19\(3\).2022.18](https://doi.org/10.21511/imfi.19(3).2022.18)
  43. Ugonna, E. A. B., & John, C. E. (2022). Foreign direct investment and economic growth in Nigeria. *GPH-International Journal of Business Management*, 5(11), 38-51. <https://doi.org/10.5281/zenodo.7316343>
  44. UNCTAD. (2020). *World Investment Report 2020: International Production Beyond the Pandemic*. Retrieved from [https://unctad.org/en/PublicationsLibrary/wir2020\\_en.pdf](https://unctad.org/en/PublicationsLibrary/wir2020_en.pdf)
  45. Voumik, L. C., Rahman, M. H., Rahman, M. M., Ridwan, M., Akter, S., & Raihan, A. (2023). Toward a sustainable future: Examining the interconnectedness among Foreign Direct Investment (FDI), urbanization, trade openness, economic growth, and energy usage in Australia. *Regional Sustainability*, 4(4), 405-415. <https://doi.org/10.1016/j.regsus.2023.11.003>

## APPENDIX A

### Threshold Test



### Threshold Graph

